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Fredrik Gunnarsson

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NIXON & VANDERHYE, PC  
901 NORTH GLEBE ROAD, 11TH FLOOR  
ARLINGTON, VA 22203

EXAMINER

WANG-HURST, KATHY W

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/594,122  
Filing Date: September 25, 2006  
Appellant(s): GUNNARSSON ET AL.

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Hyung N Sohn  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 7/10/2009 appealing from the Office action mailed 1/13/2009.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

A correct statement of the status of the claims is as follows:

Claims 1-38 and 49-51 have been canceled. Claims 39-48 and 52-66 are pending and rejected.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The appellants submitted an After Final Amendment on May 13, 2009 to simplify issues in which claims 38 and 49-51 were cancelled and claims 39, 47, 48 and 54 were amended to address clerical issues and to correct dependencies necessitated by the cancelled claims. The After Final Amendment of May 13, 2009 was entered, therefore, the rejection of claims as amended on May 13, 2009 is being appealed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5428816	Barnett et al.	6-1995
4670899	Brody et al.	6-1987

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 39-48 and 52-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al. (US 5428816) in view of Brody et al. (US 4670899).

Regarding claim 39, Barnett discloses a method of triggering a handover-related procedure for a user equipment in a cellular communications system, comprising: classifying cells of said communications system into multiple handover-related classes based on radio signal characteristics associated with said cells, each handover-related class comprises multiple cells(col. 7 lines 3-13 and col. 8 lines 11-33); assigning, for each handover-related class, a unique handover signal strength threshold(col. 7 lines 3-13 and col. 8 lines 11-33); generating a handover triggering command based on measured signal quality for a communications link between said user equipment and a base station of a cell and on an assigned handover signal strength threshold associated with the handover-related class of said cell (col. 8 lines 34-67); and transmitting said

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handover triggering command to said user equipment, said handover triggering command allowing said user equipment to perform said handover-related procedure involving said cell(col. 8 lines 34-67), wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes(col. 7 lines 3-13 and col. 8 lines 11-33).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claim 40, Barnett discloses a method for modifying a list of connected cells for a user equipment in a cellular communications system, comprising: measuring a signal quality for a communications link between said user equipment and a base station of a cell (col. 2 lines 15-33); receiving a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio signal characteristics of said cell(col. 2 lines 15-33); and modifying said list

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based on said measured signal quality and said received handover signal strength threshold (col. 6 lines 3-15).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claim 52, Barnett discloses a system for triggering a handover-related procedure for user equipment in a cellular communications system, said system comprising: means for classifying cells of said communications system into multiple handover-related classes based on radio signal characteristics of said cells, each handover-related class comprises multiple cells(col. 7 lines 3-13 and col. 8 lines 11-33), means for assigning, for each handover-related class, a handover signal strength threshold (col. 7 lines 3-13 and col. 8 lines 11-33); means for generating a handover triggering command based on measured signal quality for a communications link between said user equipment and a base station of a cell and a handover signal strength threshold associated with the handover-related class of said cell(col. 8 lines 34-67 and Fig. 6); and means for transmitting said handover triggering command to said user equipment, said handover triggering command allowing said user equipment to

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perform said handover-related procedure involving said cell (col. 8 lines 34-67 and Fig. 6), wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes(col. 7 lines 3-13 and col. 8 lines 11-33).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claim 55, Barnett discloses a unit for modifying a list of connected cells for user equipment in a cellular communications system, said unit comprising: means for measuring signal quality for a communications link between said user equipment and a base station of a cell (col. 2 lines 15-33); means for receiving a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio signal characteristics of said cell (col. 2 lines 33-60); and means, connected to said measuring means and said receiving means, for modifying said list based on measured signal quality and said received handover signal strength threshold (col. 6 lines 3-15).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claim 62, Barnett discloses a user equipment of a cellular communications system, said unit comprising: a signal quality measurer configured to measure signal quality for a communications link between said user equipment and a base station of a cell(col. 2 lines 15-33); a handover requester configured to receive a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio signal characteristics of said cell( col.4 lines 27-41 and col. 8 lines 34-67); and a list modifier connected to said signal quality measurer and said handover requester (col. 6 lines 3-15), said list modifier configured to modifying a list of connected cells for said user equipment based on measured signal quality and said received handover signal strength threshold(col. 6 lines 3-15).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claim 41, Barnett discloses the method according to claim 40, further comprising: classifying cells of said communications system into multiple handover-related classes based on radio signal characteristics of said cells, each handover-related class comprises multiple cells(col. 7 lines 3-13 and col. 8 lines 11-33); assigning, for each handover-related class, a handover signal strength threshold; and determining to which handover-related class said cell is associated(col. 7 lines 3-13 and col. 8 lines 11-33), wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes(col. 7 lines 3-13 and col. 8 lines 11-33).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody,

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allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claims 42, 43, 45, 57, 58 and 60, Barnett discloses measuring signal quality between the cell and base station and updating including adding and deleting the list according to the measured signal quality and the criteria for updating cell list.

Regarding claims 44 and 59, combination of Barnett and Brody discloses the method according to claim 42, wherein said request generating step comprises generating a cell add request if said signal quality of said cell is larger than said signal quality of said current cell subtracted by said handover signal strength threshold.

Regarding claim 46, Barnett discloses the method according to claim 39, wherein said generating step comprises: receiving a handover-triggering request from said user equipment, said request being generated based on said measured signal quality of said cell, said handover signal strength threshold and measured signal quality for a communications link between said user equipment and a base station of a current best serving cell to which said user equipment is connected(col. 8 lines 34-67); and generating said handover triggering command based on said request(col. 8 lines 34-67).

Regarding claim 47, combination of Barnett and Brody discloses the method according to claim 38, further comprising: determining communications traffic statistics for said cellular communications system; and re-classifying said cells of said communications system based on said radio coverage characteristics of said cells and said determined communications traffic statistics.

Regarding claim 48, Barnett discloses the method according to claim 38, wherein each handover- related class being associated with a unique handover signal strength threshold (col. 7 lines 3-13 and col. 8 lines 11-33).

Regarding claim 53, Barnett discloses the system according to claim 52, further comprising means for receiving a handover-triggering request from said user equipment (col. 8 lines 34-67), said request being generated based on said measured signal quality of said cell (col. 8 lines 34-67), said handover signal strength threshold and measured signal quality for a communications link between said user equipment and a base station of a current best serving cell to which said user equipment is connected (col. 7 lines 3-13 and col. 8 lines 11-33), and said generating means is configured for generating said handover triggering command based on said request (col. 8 lines 34-67).

Regarding claim 54, Barnett discloses the system according to claim 49, wherein said system is provided in a radio network controlling node in said communications system (Fig. 2 and col. 3 lines 8-9).

Regarding claim 56, Barnett discloses the unit according to claim 55, wherein cells of said communications system are classified into multiple handover-related classes based on radio signal characteristics of said cells and each handover-related class being associated with a unique handover signal strength threshold (col. 7 lines 3-13 and col. 8 lines 11-33).

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

Regarding claim 61, Barnett discloses the unit according to claim 55, wherein said unit is provided in said user equipment (col. 3 lines 25-30).

Regarding claim 63, Barnett discloses the user equipment according to claim 62, wherein cells of said communications system are classified into multiple handover-related classes based on radio signal characteristics of said cells and each handover-related class being associated with a unique handover signal strength threshold.

Barnett discloses radio signal characteristics of the cells but fails to disclose radio coverage characteristics of the cells. Brody teaches radio coverage characteristics of the cells (col. 24 lines 6-28).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the invention of Barnett, to consider radio coverage characteristics in addition to signal characteristics, as taught by Brody, allowing a more effective way of assessing handoff and dynamic load balancing (col. 24 lines 6-28).

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Regarding claims 64, 65 and 66, combination of Barnett and Brody discloses the user equipment making signal measurements between the user equipment and base station and comparing the measured values against thresholds and updating including adding and deleting the list accordingly.

## **(10) Response to Argument**

### **TECHNOLOGY BACKGROUND**

In cellular telecommunications, a mobile device communicates through a wireless connection established with a base station of cell. A cell covers only certain geographical area and there are many cells that provide a much larger coverage area. When the mobile device is moving, the device may be moving through different cell coverage areas. The connection to a cell is changed from a serving cell to a neighboring cell. This process is called a handoff or handover.

The purpose of inter-cell handoff is to maintain the call as the subscriber is moving out of the area covered by the serving cell and entering the area of the neighboring cell.

When the mobile device is moving away from the serving cell, the signal strength received from the serving cell decreases. On the other hand, as the mobile device is moving toward a neighboring cell, the signal strength received from the neighboring cell increases. At some point the signal from the serving cell is so weak that it will no longer support the communication to the mobile device and the mobile device will start a connection to the neighboring cell.

Before a handoff is performed, a target neighboring cell has to be identified. Usually a serving cell has multiple neighboring cells. Some neighboring cells have stronger signal strengths and are better candidates for a handoff than others. Therefore the multiple neighboring cells are classified into different classes based on their signal strength for handoff purposes. For example the neighboring cells having signal strength

above threshold I are classified as Class I, and neighboring cells having signal strength above threshold II are classified as Class II, and so on. Measuring signal strength from the serving cell and neighboring cells continues until certain handoff measurement conditions are met and a handoff takes place.

### **SUMMARY OF APPELLANT'S ARGUMENT AND EXAMINER'S RESPONSE TO ARGUMENT**

Appellant argues with respect to claims 39-48 and 52-66 that the combination of Barnett and Brody fails to teach or suggest classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes.

Examiner respectfully disagrees. Barnett discloses classifying neighboring cells into different classes and each class being associated with a different signal strength threshold for handover purposes (see col. 7 lines 3-12 and col. 8 lines 11-32).

Specifically, Barnett discloses the neighboring cells being classified into Class I, II and III with Class II having a threshold greater than RSSI-SRV and class III having a threshold less than RSSI-C. RSSI-SRV and RSSI-C are two different thresholds for handoff purposes.

Therefore the examiner contends that Barnett indeed teaches classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes, and therefore the combination of Barnett and Brody discloses the argued features.

### **DETAILS OF APPELLANT'S ARGUMENT AND EXAMINER'S RESPONSE**

**Brief pages 9-14: Appellant Argues the rejection of independent Claims 39 and 52 is improper under USC 103(a) in view of Barnett and Brody.**

*Brief Page 9, Appellant argues that Barnett and Brody combination fails to teach or suggest "wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes."*

Appellant argues with respect to claim 39 and 52 that Barnett does not teach or suggest classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes. Examiner respectfully disagrees. Barnett discloses classifying neighboring cells into different classes and each class being associated with a different signal strength threshold for handover purposes (see col. 7 lines 3-12). For example, Barnett discloses the neighboring cells being classified into Class I, II and III with Class II having a threshold greater than RSSI-SRV and class III having a threshold less than RSSI-C (col. 8 lines 11-32). Therefore Barnett indeed teaches classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes.

*Brief Pages 10-11, Appellant argues that Barnett does to disclose classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes. Examiner respectfully disagrees. Barnett discloses classifying neighboring cells into different classes and each class being associated with a different signal strength threshold for handover purposes (see col. 7 lines 3-12). For example,*

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Barnett discloses the neighboring cells being classified into Class I, II and III with Class II having a threshold greater than RSSI-SRV and class III having a threshold less than RSSI-C (col. 8 lines 11-32). Therefore Barnett indeed teaches classifying the cells to assign different handover signal strength thresholds associated with different handover-related classes.

*Brief Page 12, Appellant argues that Barnett does to disclose that the handover signal strength threshold associated with a first handover-related class is different from the handover signal strength threshold associated with a second handover-related class.* Examiner respectfully disagrees. Barnett discloses having Class II that has a threshold greater than RSSI-SRV and class III that has a threshold less than RSSI-C for handoff purposes (col. 8 lines 11-32). RSSI-SRV and RSSI-C are two different thresholds. Clearly the different classes have a handoff related threshold. Therefore Barnett indeed teaches the handover signal strength threshold associated with a first handover-related class is different from the handover signal strength threshold associated with a second handover-related class.

*Brief Page 13, Appellant argues that Barnett is different from what is claimed by stating that the same signal handover signal strength threshold is used for different cells even if they belong to different classes.* Examiner respectfully disagrees. The claim language is so broad that claims are given the broadest reasonable interpretation. The independent claims are broadly claiming classifying cells into multiple handover-related classes and each class is associated with a different signal threshold. Barnett discloses

classifying cells into multiple handover-related classes and each class is associated with a different signal threshold. Therefore Barnett teaches the claimed features.

**Brief pages 14-15: Appellant Argues rejection of independent Claims 40, 55 and 62 is improper under USC 103(a) in view of Barnett and Brody.**

*Brief page 14, appellant argues that Barnett and Brody in combination does not disclose all steps in claim 40 including the steps of "receiving a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio coverage characteristics of said cell" and "modifying said list based on said measured signal quality and said received handover signal strength threshold."*

Examiner respectfully disagrees. Barnett discloses means in each cell responsive to a transmission signal threshold of mobile unit for initiating a mobile assisted handoff, means responsive to the initiated handoff for generating a measurement list of identified neighboring cells for transmission to the mobile unit and means for receiving at the cell base station, signal strength measurements of the measurement list, means for replacing a portion of the reported cells with another selected portion of the total predetermined number of cells in the measurement list (see col. 2 lines 40-60). Brody teaches handing off based on radio coverage characteristics of the cells (col. 24 lines 6-28). Therefore Barnett and Brody in combination indeed discloses all steps in claim 40 including the steps of "receiving a handover signal strength threshold for said cell, said handover signal strength threshold being determined based on the radio coverage characteristics of said cell" and "modifying said list based on said measured signal quality and said received handover signal strength threshold."

*Brief Page 15, appellant argues the combination of Barnett and Brody would not guide one of ordinary skill towards determining signal strength threshold based on the radio coverage characteristics of the cells. Examiner respectfully disagrees. It is well known in the art that signal strength threshold is based on factors such as size of the cell coverage and transmission power from the base station, which are radio coverage characteristics of the cells. Therefore the combination of Barnett and Brody would indeed guide one of ordinary skill towards determining signal strength threshold based on the radio coverage characteristics of the cells.*

**Brief pages 15-16: Appellant Argues rejection of independent Claims 41, 56 and 63 is improper under USC 103(a) in view of Barnett and Brody.**

*Brief Page 15, appellant argues with respect to claim 41 that the combination of Barnett and Brody does not teach or suggest "assigning, for each handover-related class, a handover signal strength threshold" and "wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes." Examiner respectfully disagrees. Barnett discloses classifying neighboring cells into different classes and each class being associated with a different signal strength threshold for handover purposes (see col. 7 lines 3-12). For example, Barnett discloses the neighboring cells being classified into Class I, II and III with Class II having a threshold greater than RSSI-SRV and class III having a threshold less than RSSI-C (col. 8 lines 11-32). Therefore combination of Barnett and Brody does teach or suggest "assigning,*

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for each handover-related class, a handover signal strength threshold" and "wherein a handover signal strength threshold associated to a first handover-related class of said multiple handover-related classes being different from a handover signal strength threshold associated to a second handover-related class of said multiple handover-related classes."

*Brief Page 16, appellant argues with respect to claims 56 and 63 that Barnett and Brody combination does not disclose "wherein cells of said communications system are classified into multiple handover-related classes based on radio coverage characteristics of said cells and each handover-related class being associated with a unique handover signal strength threshold."* Examiner respectfully disagrees. Barnett discloses having Class II that has a threshold greater than RSSI-SRV and class III that has a threshold less than RSSI-C for handoff purposes (col. 8 lines 11-32). RSSI-SRV and RSSI-C are two different thresholds for handoff purposes. Clearly the different classes have a handoff related threshold. Therefore Barnett and Brody combination does not disclose "wherein cells of said communications system are classified into multiple handover-related classes based on radio coverage characteristics of said cells and each handover-related class being associated with a unique handover signal strength threshold."

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,

/KATHY WANG-HURST/

Examiner, Art Unit 2617

Conferees:

/NICK CORSARO/

Supervisory Patent Examiner, Art Unit 2617

/George Eng/

Supervisory Patent Examiner, Art Unit 2617